

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>OZ 00603-WO</b>	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. <b>PCT/EP2004/051514</b>	International filing date (day/month/year) <b>15.07.2004</b>	Priority date (day/month/year) <b>16.07.2003</b>	
International Patent Classification (IPC) or national classification and IPC <b>B01J21/06, B01J35/00, B01J37/025, B01J37/34</b>			
Applicant <b>PROFINE GMBH</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <b>9</b> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <b>6</b> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																								
<p>4. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/051514

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))  
 publication of the international application (Rule 12.4)  
 international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished  
 the description:

pages 1, 2, 6-10 as originally filed/furnished

pages\* 3-5 received by this Authority on 13.04.2005 with letter of 11.04.2005

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

nos. \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* 1-10 received by this Authority on /filed with the demand

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

sheets 1/5-5/5 as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (*specify*): \_\_\_\_\_  
 any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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## 1. Statement

Novelty (N)	Claims	1-10	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-10	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims		NO

## 2. Citations and explanations (Rule 70.7)

1. This report refers to the following documents:

D1: EP 1 016 458 A (ORIENT CHEMICAL IND; OSAKA MUNICIPAL GOVERNMENT (JP)) 5 July 2000 (2000-07-05)

D2: DE 101 58 433 A (NANO X GMBH) 12 June 2003 (2003-06-12)

D3: US 2002/045073 A1 (FINLEY JAMES J) 18 April 2002 (2002-04-18)

## 2. DOCUMENT D1

2.1 D1 (see paragraphs 9, 16, 17, 26, 61) describe a photocatalytic coating where the actual photocatalytic layer is applied to an intermediate layer. Anatase is used as photocatalyst (e.g. example 1).

$ZrO_2$  as well as  $SiO_2$  are cited as suitable material for the intermediate layer (claim 12). The intermediate layer is produced by polycondensation of the alkoxides (claim 13). The organic polymer concentration in the region adjoining the

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photocatalytic layer is ~ 0% (paragraph [0033]).

The examples (example 1) also show that only the "first intermediate layer" contains an organic polymer whereas the "second intermediate layer" is produced without adding an organic polymer, i.e. consists of the oxide or oxides.

The intermediate layer preferably shows no photocatalytic activity (paragraph [0017]), thus implying that no  $TiO_2$  is present.

Also, the intermediate layer known from D1 should be considered just as "nonporous" as the intermediate layer described in the application (same method of production).

## 2.2 INDEPENDENT CLAIM 1

The subject matter of claim 1 differs from D1 in the weight ratio of  $SiO_2$  to  $ZrO_2$  (however, see Box 1).

It is not apparent, however, that this difference yields any technical effect that might substantiate an inventive step (apt comparative examples lacking), and hence claim 1 does not involve an inventive step.

Table 1 of the present application would appear to indicate rather that the problem of interest has already been solved by  $SiO_2$  alone.

## 2.3 INDEPENDENT CLAIM 5

D1 is relevant to claim 5 for the same reasons. In particular, the corresponding method steps are

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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described in example 1, including the step of heat treatment at 100° C. It is generally understood, moreover, that Si can be replaced by Zr. The method defined in claim 5 differs, then, from D1 in the weight ratio between ZrO<sub>2</sub> and SiO<sub>2</sub> and in that the duration of the heat treatment is 10 to 300 sec.

The selection of the appropriate conditions for the heat treatment is a matter of standard practice for a person skilled in the art and does not substantiate an inventive step. The subject matter of claim 5 therefore is not inventive in relation to D1 either.

#### 2.4 INDEPENDENT CLAIM 10

According to D1, the coating is also suitable for articles made of polymer materials molded in any shape (paragraph [0016]), e.g. plates.

The subject matter of this claim likewise differs, then, from D1 in the weight ratio between ZrO<sub>2</sub> and SiO<sub>2</sub> and is therefore not inventive for the reasons already indicated (see 2.2).

#### 3. DOCUMENT D2

Document D2 also suggests the subject matter of the independent claims:

3.1 D2 describes a similar coating as in D1 (see examples) wherein the primer layer is produced by a sol-gel method (paragraph [0022], claim 10) and can consist of SiO<sub>2</sub> or ZrO<sub>2</sub> (claim 2 of D2).

According to D2, the porosity is < 2nm (claim 3),

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which can be regarded as "nonporous" (cf. Box VIII). In particular, the images depicted in the present application indicate that the term "nonporous" in the present application refers to pores in the micrometer range. Pores of a magnitude < 2nm would not be identifiable in the images (fig. 3-16).

The subject matter of claim 1 also differs from D2 in the presence of ZrO<sub>2</sub> and SiO<sub>2</sub> in the given weight ratio and is therefore not inventive for the reasons already cited (see 2.2).

3.2 D2 (paragraphs [0032]-[0034]; example 3) describes a method of production from which the subject matter of claim 5 differs in the weight ratio between SiO<sub>2</sub> and ZrO<sub>2</sub> and in that a heat treatment is carried out at 20° C to 120° C for 10 to 300 sec.

3.3 D2 describes coated objects according to claim 10 (see paragraph [0035]), and hence claim 10 is not inventive for the same reasons as with claim 1.

4. DOCUMENT D3

4.1 D3 (examples) describes a photocatalytic coating of a TiO<sub>2</sub> layer on a ZrO<sub>2</sub> layer. The ZrO<sub>2</sub> layer can contain other constituents (paragraph 37). Various polymer materials are indicated as substrate (paragraph 23).

D3 does not describe an underlayer of ZrO<sub>2</sub> and SiO<sub>2</sub> in the indicated weight ratio. AS D3 does not relate to the problem of breakdown of the carrier

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material, D3 is not relevant to the assessment of inventive step.

**5. DEPENDENT CLAIMS 2-4, 6-9**

5.1 Claims 2-4 and 6-9 do not contain any features which in combination with the features of any claim to which they relate meet the PCT requirements for inventive step.

6. The industrial applicability of the claimed subject matter is recognized.

## Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The term "nonporous" is used to characterize an oxide layer. However, it appears that such a material always has a certain porosity, though the pore size is not defined.

In particular, the images depicted in the present application indicate that the term "nonporous" relates to pores in the micrometer range. Pores of a magnitude  $< 2\text{nm}$  would not be identifiable in the images (fig. 3-16).

This feature is therefore unclear (PCT Article 6). Consequently, it is unsuitable for delimiting the claimed subject matter from the prior art.

2. According to claim 7, water is included as an organic suspending medium, contrary to the usual meaning of the term. The definition of "organic suspending medium" thus relates to any suspending medium.

For this reason the term "organic suspending medium" is unclear.

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

1. The amendments filed with the demand for international preliminary examination introduce substantive matter that goes beyond the disclosure in the international application as filed. These amendments are as follows:

in independent claims 1 and 5, the substitution of the  $\text{SiO}_2:\text{ZrO}_2$  ratio for the indication that the underlayer has at least 5%  $\text{ZrO}_2$ .

The indicated  $\text{SiO}_2:\text{ZrO}_2$  ratio is consistent with a  $\text{ZrO}_2$  content of at least 5% by weight only in the particular case in which the underlayer consists of  $\text{ZrO}_2$  and  $\text{SiO}_2$ . If there are other constituents (see claim 2), the indicated  $\text{SiO}_2:\text{ZrO}_2$  ratio encompasses a  $\text{ZrO}_2$  content < 5% by weight, contrary to the subject matter originally disclosed.

**Therefore, the present examination relates to embodiments according to claims 1 and 5 wherein the underlayer consists of  $\text{ZrO}_2$  and  $\text{SiO}_2$ .**

2. The amendments in the description are inadmissible for the same reasons (newly filed pages 3-5).